

THE PRESENT CONDITION OF THE SEA-FISHING INDUSTRY.¹

"THE methods employed in the capture and transport of fish, the great combinations of capital, the trade organisations, the disputes between the trade and the railway companies, local upheavals, like those of Newlyn and Grimsby, which temporarily paralysed the industry, the efforts of science to unveil the secrets of the sea, and of Parliament first to encourage such investigation and then to act upon its results; these have in turn been briefly dealt with. Lastly, we visited most of the important fishing ports." Such in the author's words is an outline of the plan of this book.

Historically the work is of interest as being the first popular and general account of the sea-fishing industry which has appeared since Holdsworth's "Deep-Sea Fishing," an admirable treatise of similar scope published thirty years ago. A good idea of the rapid progress of the industry in the interval may be gathered from a comparison of the two. Curiously enough, Holdsworth doubted the probability of any extensive adoption of either steam power or the otter trawl in relation to commercial fishing. Contrary to this forecast these very two factors, together with ice and railway facilities, have effected nothing short of a revolution in the industry. It is possible that the next decade or so may also have surprises in store as the result of trade enterprise on the one hand and scientific investigation on the other.

Mr. Aflalo wisely refrains from pronouncing any strong opinions as to future developments.

After a short sketch on "Life in the Sea," in which the chief of the facts known about the life-histories of the edible fishes are mentioned, the author proceeds to describe the various processes involved in the capture and distribution of fish. These subjects receive adequate if not exhaustive treatment, and are made as interesting as possible by Mr. Aflalo's well-known popular style of writing. Then follow two important chapters on legislation and scientific investigation. The final section consists of interesting notes on the different kinds of fishing practised at each important station along the coast, the condition of the harbours (usually defective), railway facilities, local modifications of the share system of wage-payment, and the general prosperity, or otherwise, of the port in question. The contrasts in some cases are very striking, as, for example, between the mushroom-like development of steam-trawling in the hands of syndicates, as at Grimsby, and the moderate but steady prosperity associated with private enterprise at a typical smack-trawling port like Brixham. The former may be safely described as the busiest and least picturesque port in the kingdom, while Brixham, which three-quarters of a century ago supplied the pioneers of the North Sea fishery, and still breeds a notably hardy and resourceful type of man, remains attractive in the old-fashioned way.

In dealing with such controversial matters as legislation and scientific investigation, Mr. Aflalo represents the two sides of a question with some skill, and,

absolutely committing himself to neither, has a good word to say for both. Nevertheless, this attempt to steer a sort of middle course among the different opinions leads to no very definite results. The latest Sea-Fisheries Bill he appears to regard as a measure which might do some good, and cannot, in view of its elastic and unbinding character, do much harm; it has, in fact, its good points. International scientific investigation is strongly advocated, "although effectual investigation of the vast bed of the North Sea is out of the question," and "however faulty the Christiania programme may be when analysed on a purely economic basis."

The continued participation of Britain in the international investigations is recommended for the following reasons:—"As a piece of scientific work on an elaborate scale, the North Sea scheme is not unworthy of a century which opened with the discovery of radium and the *n*-rays. As a measure of high politics it is at least equal to the Anglo-French Agreement of which so much more has been heard."

Apart from purely diplomatic considerations, such

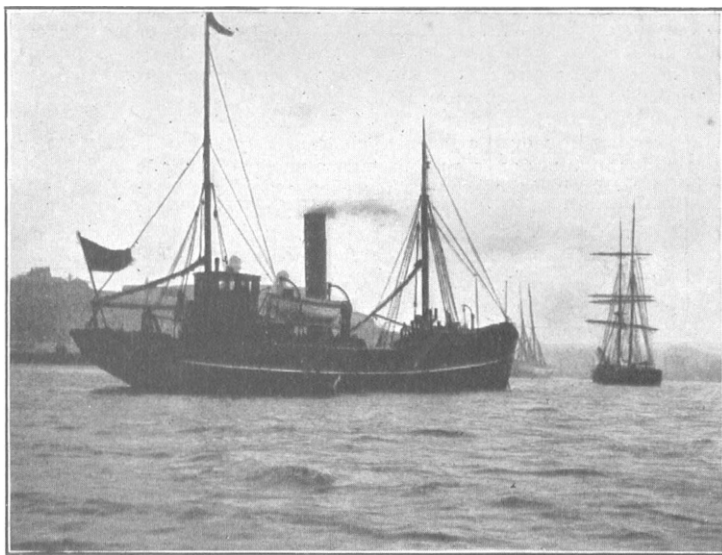


FIG. 1.—The *Huxley*, specially commissioned to carry out fishery investigations. From Aflalo's "Sea-fishing Industry of England and Wales."

as the above, the flat-fish problem, which is understood to be receiving special attention at the hands of the international experts, is surely very largely an international one, if only on account of the well-ascertained fact that by far the most important nurseries of the plaice are on the Continental side. One awaits with interest the full details of these researches, especially of certain experiments on the marking of plaice, as a result of which it has been stated (in a short report recently issued by the council of the Marine Biological Association) that the species performs seasonal migrations of considerable extent and definite direction, and further that 20 per cent. of the English marked plaice have been recovered and returned by the fishermen within a year. The latter result indicates an intensity of fishing such as may conceivably affect the supply of this fish. Still more interesting economic possibilities—standing, perhaps, in relation to the last as the antidote to the evil—are suggested by some reports recently circulated in the newspapers. These speak of the phenomenal growth of small plaice liberated on the Dogger Bank, to which they had been transplanted from certain crowded inshore "nurseries." Investigations such as these bear directly on questions of

¹ "The Sea-fishing Industry of England and Wales. A Popular Account of the Sea Fisheries and Fishing Ports of Those Countries." By F. G. Aflalo, F.R.G.S., F.Z.S. With a sea-fisheries map and numerous photographs by the author and others. Pp. xx + 386. (London: Edward Stanford, 1904.) Price 16s. net.

supply, and are evidently inspired by a determination to give something like concrete value for public money.

While awaiting the verdicts of science and the deliberations of legislators, it is useful to have to hand a work such as this, which gives a concise statement and accurate picture of the present condition of the great sea-fishing industry.

The book is abundantly supplied with interesting photographs. There is also a sea-fisheries map, in which, however, is one glaring defect. From this map it would appear that Yarmouth and Lowestoft are given over entirely to the drift-net fishing, and that neither of these places has any connection by rail with the metropolis. This is inconsistent with what is stated in the text, and is opposed to common knowledge.

THE ELEVENTH EROS CIRCULAR.¹

THE appearance of this volume brings us definitely face to face with a new situation in the derivation of accurate positions of the heavenly bodies from photographs. It will be remembered that in the winter of 1900-1 the recently discovered small planet Eros made a very near approach to the earth, and a large number of photographs were taken with the view of determining the distance of the planet, from a knowledge of which that of the sun, and the dimensions of the solar system generally, could be inferred with (it was hoped) considerably improved accuracy. The measurement of the plates involves enormous labour, and has only been partially accomplished in the intervening four years; and the discussion of the measures has necessarily proceeded even more slowly. But the present publication of more than 400 quarto pages represents a notable addition to the tabular statement of measures, and contains an important contribution to the discussion.

It appears that the plates taken at different observatories are liable to disagreement in a serious manner. Putting aside the planet itself for a moment, when the positions of the stars found from plates taken at the Algiers Observatory are compared with those found from plates taken at Paris, there is a difference varying with the brightness of the individual stars. Such a difference is not altogether new in astronomy; it was pointed out by Sir David Gill a dozen years ago or more that eye observations of stellar positions made by different observers were likely to differ systematically in this manner; but this was attributed to human defects in the observer, and it was hoped that photography would free us from the embarrassment. So it probably will when rightly used; but we have apparently not yet completely realised the necessary precautions. The instruments for taking the photographs at Algiers and at Paris are as precisely similar as the constructor could make them; they were used in the same way; the plates were measured similarly and with careful attention to certain known sources of error, and yet the resulting star places show the following differences in seconds of arc in the mean of 5 groups of 87 stars each:—

Mean magnitude	Difference
8.8	-0.27
9.4	-0.42
10.4	-0.57
11.2	-0.72
11.6	-0.83

There is a range of more than half a second, and we want to measure the hundredth of a second! This is probably an exceptional case; but what may occur once may occur again, and in view of this fact it is

¹ Conference astrophotographique internationale de Juillet, 1900. Circulaire No. 11. (Paris: Gauthier Villars, 1904.)

not too much to say that a very serious addition has been made to the labour of determining the quantity sought—the solar parallax—by this revelation.

It is disappointing to find no satisfactory suggestion of the cause of error in the paper which gives an account of it. A suggestion is indeed made, viz. that in measuring a plate the presence of an adjacent image (for the exposure is repeated on the same plate so as to show all the images more than once) may disturb the eye of the measurer. All our experience hitherto is against such a possibility. It seems more likely to the writer that the cause may be sought in the object glass of the photographic telescope, and, to be more precise, in an error of centring of the crown lens relatively to the flint. Such an error is well known to opticians, and is easily detected in a visual telescope by the fringe of colour on one side of a star image when slightly out of focus. But the images formed by a photographic telescope are not examined by the eye in the regular course of work, and such an error might therefore escape detection until revealed by such a comparison of measures as is given above. The stray light on one side of the image would not be strong enough to affect the sensitive film in the case of faint stars, but for a bright star it would spread the image in that direction, and so introduce a spurious displacement of the centre. If this explanation be correct, the error can be both detected and eliminated by turning the object glass through 180° (with most forms of telescope mounting it is only necessary to turn the telescope to the other side of the pier), and this can easily be done. Indeed, it ought to have been done before now, under the admirable maxim for physical work, "reverse everything that can be reversed," but, so far as is known to the writer, the point has hitherto escaped notice.

If on examination this explanation will not fit the facts, some other must be found. A few additional details in the volume before us would have made it possible to test this hypothesis; if, for instance, it had been specified which plates were taken on one side of the pier and which on the other, a comparison of the two sets would have given very definite information. Mr. Hinks has already given cogent reasons (see *Observatory* for September, 1903) for regretting the lack of information as to the identity of the individual plates, and we have now to add this further reason. For the systematic difference described is not confined to Algiers-Paris. If we turn to the paper following that in which M. Trépied gives the figures above quoted and arrange the differences found at the Goodsell Observatory (Carleton College, Minnesota) according to stellar magnitude, we find a well marked effect in R.A. and a smaller one in dec.; and probably other cases, when duly examined, will give similar results, though it does not seem to have occurred to astronomers generally to make a properly searching inquiry. For instance, at the end of the volume M. Lœwy tabulates a series of differences between two lists of star places prepared with great care by himself and by Prof. Tucker, of the Lick Observatory, and he comments with satisfaction on the close accordance of the two lists. But a very slight examination suffices to show that the differences are affected with "magnitude-equation," though in this instance the effect may be due to the visual observations.

In fact, while duly admiring the energy and diligence with which this vast mass of material has been collected and published, a result due in great part to the powers of organisation of M. Lœwy, the director of the Paris Observatory, we may well feel some doubts whether it will turn out to be, as he hopes, a "collection of homogeneous material, susceptible of being immediately used without the necessity of undertaking,